CLAIMS:

1. A method for obtaining MRI images of an object (8) to be examined in an imaging volume of an MRI apparatus, the object having a longitudinal axis in the y-direction, in which method:

a homogeneous magnetic field is provided in the z-direction in the imaging volume of the apparatus,

the object to be examined (8) is positioned in the imaging volume such that its longitudinal axis extends transversely of the z-direction,

an RF excitation pulse is generated in the imaging volume of the apparatus,

magnetic resonance signals which are due to the RF excitation pulse are acquired by means of at least one RF receiving coil,

characterized in that

the magnetic resonance signals which are due to the RF excitation pulse are acquired in a sub-sampled fashion by means of a set of at least two RF receiving coils (20),

a magnetic resonance image is derived from the sub-sampled magnetic resonance signals and on the basis of previously determined spatial coil sensitivity profiles of each RF coil in the set of RF receiving coils (20), said spatial coil sensitivity profiles being mutually independent, and

the planes of the at least two receiving coils extend substantially parallel to one another and to the z-direction.

2. A method as claimed in Claim 1, wherein the receiving coils are embodied as butterfly coils.

3. A method as claimed in Claim 2, wherein the butterfly coils are sensitive to an RF field component transversely of the z-direction.

4. A method as claimed in Claim 3, wherein two further butterfly coils (40-1, 40-2) are provided such that each time two butterfly coils are situated adjacently in the same coil plane and all coils are sensitive to the same RF field component.

5. A method as claimed in Claim 3, wherein two further butterfly coils (30-2, 30-4) are provided such that each time one further butterfly coil (30-2) is concentrically arranged relative to one butterfly coil (30-1) of said set of at least two RF receiving coils, the one further butterfly coil and the one butterfly coil of said set of at least two RF receiving coils being situated in the same coil plane and said further butterfly coils being sensitive to an RF field component transversely of the RF field component whereto the butterfly coils of said set are sensitive.

6. A method as claimed in Claim 4, wherein two single coils (60-5, 60-6) having mutually parallel coil planes are arranged in such a way that their coil planes extend transversely of the planes of the butterfly coils (60-1, 60-2, 60-3, 60-4).

7. A method as claimed in Claim 5, wherein:

* there is provided a first set of single coils (70-7, 70-8) which have mutually parallel coil planes and are arranged in such a way that their coil planes extend transversely of the planes of the butterfly coils (70-1, 70-2),

* there is provided a second set of single coils (70-5, 70-6) which have mutually parallel coil planes and are arranged in such a way that their coil planes extend transversely of the planes of the butterfly coils (70-1, 70-2) as well as transversely of the planes of the first set of single coils (70-7, 70-8), and

* there is provided a further set of butterfly coils (70-3, 70-4) such that each time one further butterfly coil (70-3, 70-4) is arranged concentrically with one single coil (70-8, 70-7) of said first set, which coils are situated in the same coil plane.

8. A method as claimed in Claim 3, wherein two single coils (50-3, 50-4) are provided such that a first one and a second one of the single coils is arranged concentrically with a first one and a second one of the butterfly coils (50-1, 50-2), respectively, which first coils are situated in the same coil plane and so are the second coils.